

Claims

- [c1] We claim:
1. A precision variable rate dispensing apparatus comprising:
a support member;
an eductor connected to the support member, the eductor having a liquid inlet,
an inlet for liquid concentrate and an outlet for a mixed solution;
a needle valve assembly in fluid communication with the inlet for liquid
concentrate, the needle valve assembly including a valve body, a needle
member for reciprocal movement with respect to a passage to vary flow
therethrough, a cam follower portion connected to the needle member;
a cam member positioned between the cam follower portion and the passage,
the needle member constructed and arranged so that when the needle member
is turned in one direction, with the cam follower portion contacting the cam
member and the needle member moving in one direction, the needle member
will move away from the passage to increase flow through the valve and when
the needle member is turned in the opposite direction the needle member will
move in the direction of the passage to reduce flow through the valve.
 - [c2] 2. The dispensing apparatus as defined in claim 1 wherein the cam member is
constructed and arranged so that a single revolution of the needle portion will
cause a full operation of the valve.
 - [c3] 3. The dispensing apparatus as defined in claim 1 wherein the cam follower is
defined by a flange member extending from the needle portion.
 - [c4] 4. The dispensing apparatus as defined in claim 1 wherein the needle valve
assembly is positioned in a parallel manner with respect to the eductor.
 - [c5] 5. The dispensing apparatus as defined in claim 1 wherein the needle valve
assembly is positioned in a perpendicular manner with respect to the eductor.
 - [c6] 6. The dispensing apparatus as defined in claim 1 wherein a dial member is
connected to the needle portion outside of the valve body.
 - [c7] 7. The dispensing apparatus as defined in claim 1 wherein the valve body is
interconnected to the eductor at one end of the eductor and the inlet for liquid

concentrate to a side of the valve body.

[c8] 8. The dispensing apparatus as defined in claim 1 wherein the cam member is defined by a one piece, ramped, annular component.

[c9] 9. A precision variable rate dispensing apparatus comprising:
a support member;
an eductor connected to the support member, the eductor having a liquid inlet, an inlet for liquid concentrate and an outlet for a mixed solution;
a needle valve assembly in fluid communication with the inlet for liquid concentrate, the needle valve assembly including a valve body, a needle member for passage to vary flow therethrough;
a cam follower portion connected to the needle member;
a cam member positioned between the cam follower member and the passage, the cam member having a cam surface with a first degree slope and a rapidly increasing slope;
the cam member and cam follower portion constructed and arranged so that when the needle member is turned in one direction, with the cam follower portion contacting the cam member, the valve will increase flow therethrough and when the needle member is turned in the opposite direction the valve will decrease flow therethrough.

[c10] 10. The dispensing apparatus as defined in claim 9 wherein the second degree slope of the cam surface terminates in an end wall connected to the first degree slope.